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Briefs (3)
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12/11/03

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE
Before the Board of Patent Appeals and Interferences

In re Application of

Confirmation No.: 7933

Hitoshi SATO

Art Unit: 2853

S. N. 09/701,777

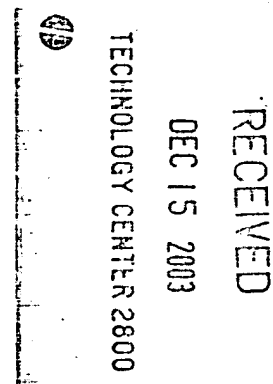
Examiner: B. Mouttet

Filed: December 1, 2000

For: INK-JET RECORDING METHOD AND DEVICE

BRIEF ON BEHALF OF APPELLANT

Mail Stop Appeal Brief Patents
Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450



Sir:

This is an appeal from the Examiner's final rejection mailed February 5, 2003.

REAL PARTY IN INTEREST

The real party in interest is Canon Finetech Inc., the assignee of the application by merger thereinto of Coper Co., Ltd. Coper Co., Ltd. was the original assignee of the application from the inventor.

RELATED APPEALS AND INTERFERENCES

No related appeals or interferences are known to appellant, the appellant's legal representative, or assignee, which will

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directly affect or be directly affected by or have a bearing on the Board's decision in the pending appeal.

STATUS OF CLAIMS

Claims 1-12 are pending in the application, are rejected, and are the claims under appeal. Appellant wishes to prosecute this appeal with respect to claims 1-12.

This application was originally filed July 7, 2000. A final office action was issued February 5, 2003, and in response, this appeal was filed.

STATUS OF AMENDMENTS

An amendment was filed subsequent to final rejection, but was not entered by the Examiner. An appendix of claims is included showing the claims without entry of that amendment.

SUMMARY OF THE INVENTION

This invention relates to an ink-jet recording device which addresses issues of "splash" events, where a high density image area being printed would result in such an amount of ink deposition on the recording medium, that splashing or such event results, leading to an uneven or degraded printed image. This is accomplished by use of an interpreter, which before converting vector data of a line or filled in area to raster data for

printing, checking whether the data pattern indicates a solid drawing. If the solid drawing is indicated (meaning high ink density will result on printing), then the data pattern to be printed is changed to a lower-density to prevent ink splash during printing. FIG. 4 illustrates an example line and area which are "thick" and would employ lower density printing pattern to avoid splash (page 9, line 17- page 10 line 8).

THE ISSUES

The broad issue presented in this appeal is whether the Examiner's final rejections of claims 1-12 are correct. The issue may be stated more narrowly as:

1. Whether claims 1, 2, 4-8 and 10-12 are obvious under 35 U.S.C. §103(a) over Karaki (U.S. 5,699,492) in view of Klassen (U.S. 5,515,479) and Albosta et al (U.S. 4,908,638).

2. Whether claims 3 and 9 are obvious under 35 U.S.C. §103(a) over Karaki (U.S. 5,699,492) in view of Klassen (U.S. 5,515,479) and Albosta et al (U.S. 4,908,638) and further in view of Mizutani (U.S. 5,774,146).

GROUPING OF CLAIMS

For the purposes of this appeal, claims 1-12 stand or fall together.

ARGUMENT

1 & 2. Claims 1, 2, 4-8 and 10-12 are not obvious over Karaki (U.S. 5,699,492) in view of Klassen (U.S. 5,515,479) and Albosta et al (U.S. 4,908,638) because the cited documents either alone or in combination do not teach or suggest applicant's claims. Claims 3 and 9 are not obvious under 35 U.S.C. §103(a) over Karaki (U.S. 5,699,492) in view of Klassen (U.S. 5,515,479) and Albosta et al (U.S. 4,908,638) and further in view of Mizutani (U.S. 5,774,146) because the cited documents either alone or in combination do not teach or suggest applicant's claims.

Karaki, the principal reference employed in the rejections, is not attempting to solve the problem that applicant is solving. Karaki is concerned with issues related to using pure black or composite black made from color inks, and does various processing on black areas to decide whether to use pure black or composite black composed from C, M and Y inks. Applicant's claimed invention, in contrast, is concerned splash reduction, and, in certain aspects, with black only, not with color inks. The present application notes on page 7, lines 10-11, that this embodiment applies only to black, because the issue of image quality degradation due to splashes is less conspicuous for colors other than black.

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Claim 1 includes the phrase "for preventing an ink splash during printing".

Note also that Karaki does not mention the word splash (nor do either of the other documents the Examiner relies on (Klassen and Albosta and Mizutani)).

Karaki is only concerned with the issue of deciding when to use composite black (C M Y) or pure black ink. It does not appreciate the issue that applicant is trying to solve related to splash prevention.

Also, applicant respectfully believes that the Examiner's characterization of what Karaki is teaching is not warranted. The Examiner says that Karaki discloses that data indicates a drawing of a thick line or filled in area in col. 2, lines 26-34. However, what is discussed in this portion of Karaki is related to whether to use color inks or pure black ink. The document is discussing black areas vs. color areas, not thick line or filled in area.

Further, applicant respectfully submits that there is not a valid motivation to combine these documents, either, since the Examiner is applying a single color high speed mode of Albosta to a device concerned with applying a single ink black or a composite black using color inks.

The purpose of the applicant's invention of splash reduction is not mentioned nor even considered in the cited documents.

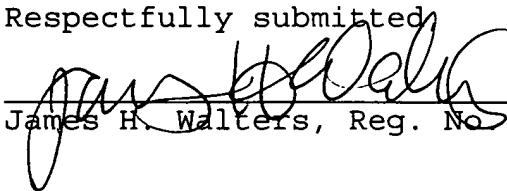
It is respectfully submitted that there is no motivation to combine the other documents into Karaki, since it is concerned with different issues, and it is applicant's teaching that raises the issues, not the teaching of the prior art. Therefore, the motivation to combine is not present in the prior art.

Even if the documents were combined, applicant's claimed invention would not thereby be produced.

CONCLUSION

In view of the foregoing, it is submitted that claims 1-12 of this application are patentable, and it is accordingly requested that the Examiner's final rejection be reversed and that allowance of this application be directed.

Respectfully submitted,


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APPENDIX OF CLAIMS

1. An ink jet recording method which receives a command and data which indicate a drawing of a thick line or a filled-in area, analyzes the command and the data by an interpreter, converts vector data of the thick line or the filled-in area into raster data based on a specified data pattern which contains a predetermined matrix of ON and/or OFF dots, after the analysis, and, based on the raster data, ejects ink droplets while moving a recording head over a recording medium with a plurality of ink ejection nozzles arranged thereon, said method comprising the steps of:

before converting the vector data to the raster data, checking by said interpreter whether the specified data pattern indicates solid-drawing in the thick line or the filled-in area for which the drawing is indicated;

if the data pattern specified to a particular thick line or filled-in area indicates solid-drawing, changing the data pattern for that particular thick line or filled-in area to a data

pattern of a lower-density for preventing an ink splash during printing; and

converting the vector data of the thick line or the filled-in area into raster data based on the vector data and the data pattern when ejecting ink droplets according to the raster data;

wherein said recording method is performed while operating said recording head in a single pass recording mode.

2. The ink jet recording method according to claim 1 wherein said interpreter changes the data pattern by using a predetermined mask pattern.

3. The ink jet recording method according to claim 2 wherein one mask pattern is selected from a plurality of predetermined mask patterns according to a type of the recording medium.

4. The ink jet recording method according to claim 1 wherein if a thickness of a given thick line is smaller than a predetermined thickness no change is made in the data pattern for the given thick line even if the data pattern indicates solid-drawing.

5. The ink jet recording method according to claim 1 wherein the data pattern is changed at least for black ink.

6. The ink jet recording method according to claim 1 wherein said single pass recording mode comprises a method in which one band of an image is recorded in one head movement of the recording head, said one band corresponding to a width of a recording portion of said recording head.

7. An ink jet recording device comprising:
an interpreter for analyzing a command and data which indicate a drawing of a thick line or a filled-in area;
means for converting vector data of the thick line or the filled-in area into raster data based on the vector data and a specified data pattern which contains a predetermined matrix of ON and/or OFF dots, after the analysis by the interpreter; and
a recording head for ejecting ink droplets, based on the raster data, while moving over a recording medium with a plurality of ink ejection nozzles arranged thereon,
wherein said interpreter includes a pattern changing means for checking whether the data pattern indicates solid-drawing in the thick line or the filled-in area for which the drawing is indicated and, if the solid-drawing is indicated, changing the data pattern for the thick line or filled-in area to a data pattern of a lower-density.

8. The ink jet recording device according to claim 7 wherein said pattern changing means changes the data pattern by

using a predetermined mask table which stores therein a predetermined mask pattern.

9. The ink jet recording device according to claim 8 wherein said predetermined mask table contains a plurality of mask patterns each corresponding to a type of the recording medium and wherein said pattern changing means selects one of the mask patterns according to the type of the recording medium used.

10. The ink jet recording device according to claim 7, further comprising means for checking a thickness of the thick line and means for preventing the change of the data pattern when the thickness of the thick line is smaller than a predetermined thickness.

11. The ink jet recording device according to claim 7 wherein said pattern changing means changes the data pattern at least for black ink.

12. The ink jet recording device according to claim 7 wherein said single pass recording mode comprises a method in which one band of an image is recorded in one band movement of the recording head, said one band corresponding to a width of a recording portion of said recording head.